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Reports to the Surgeon-General, Public Health and Marine-Hospital Service Experimental transmission of Rocky Mountain Spotted Fever by means of the tick

PRELIMINARY NOTE

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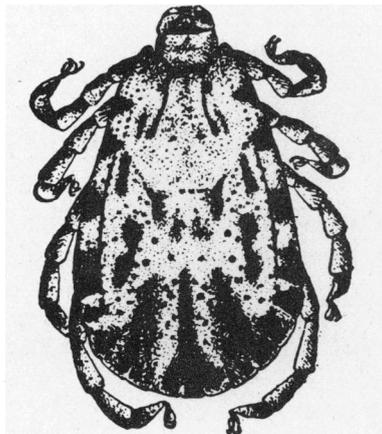
Detailed April 19, 1906, by the Surgeon-General to investigate
the disease in Montana

The belief that spotted fever was caused by piroplasma, a genus of organisms carried by ticks, and the coincidence of the season of prevalence of the fever with that in which the ticks are found, suggested to Wilson and Chowning the possibility that the tick was the agent concerned in the transmission of the disease.

The theory was extremely difficult of either proof or disproof, the fatality being too great to justify experimentation with human subjects, and until the present season none of the lower animals were shown to be susceptible to the infection.

During the spring of 1906, guinea pigs and monkeys were proved to be susceptible to spotted fever by direct inoculation with blood from patients. The typical fatal disease was repeatedly produced by Ricketts and by myself, and I am still continuing the disease from one animal to another.

To prove or disprove tick infection now seemed possible, and with this idea in view, I placed 1 male and 3 female ticks (*Dermacentor occidentalis*) on a guinea pig suffering with spotted fever. They remained until removed after the death of the



animal two and one-half days later. The female ticks were but slightly enlarged.

These ticks were taken to the Hygienic Laboratory, Washington, D.C., the male dying in transit.

Nine days after removal from the first guinea pig, the remaining female ticks were placed upon a healthy guinea pig. One was killed by the guinea pig. The others remained until they dropped off after five days. Three days later the guinea pig began to show symptoms. It developed the same clinical picture as those animals inoculated directly with infectious blood. There was fever, emaciation, enlargement of the scrotum, very marked hemorrhagic eruption of skin of scrotum, ears, feet, and back. At death two hemorrhagic spots on the scrotum were becoming gangrenous. The tick-infected pig had been kept in a separate cage, and at no time was in any contact with other animals having spotted fever. A guinea pig was inoculated with the heart's blood from the tick-infected pig. It has sickened, and apparently will develop the disease.

Whether the transference was mechanical, or whether the infecting organism must undergo a cycle of development remains to be determined, and will be the subject of further experiments. However, it seems conclusive that the tick is capable, under certain circumstances, of conveying the infection from guinea pig to guinea pig, whether the transmission be mechanical or biological.

This fact is the first positive experimental evidence in favor of the tick theory and reopens the question of this method of infection in man. At least it deserves the serious consideration of people living within infected territory.